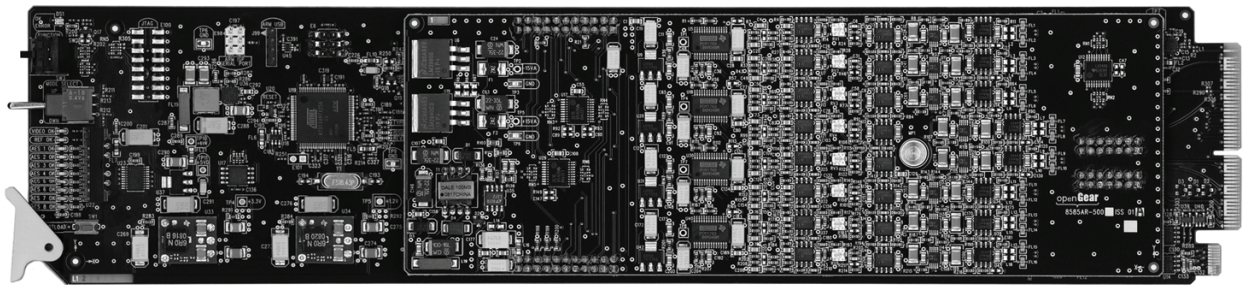
Ross Video Limited

MUX-8258 (-A, -4C, -8C)
AES/EBU/Analog Audio Multiplexer
User Manual



ROSS
Live Production Technology

openGear

MUX-8258 (-A, -4C, -8C) • AES/EBU/Analog Audio Multiplexer User Manual

- Ross Part Number: **8258DR-004-04**
- Release Date: August 4, 2011. Printed in Canada.

The information contained in this manual is subject to change without notice or obligation.

Copyright

© 2011 Ross Video Limited. All rights reserved.

Contents of this publication may not be reproduced in any form without the written permission of Ross Video Limited. Reproduction or reverse engineering of copyrighted software is prohibited.

Patents

This product is protected by the following US Patents: 4,205,346; 5,115,314; 5,280,346; 5,561,404; 7,034,886; 7,508,455; 7,834,866; 7,914,332. This product is protected by the following Canadian Patents: 2039277; 1237518; 1127289. Other patents pending.

Notice

The material in this manual is furnished for informational use only. It is subject to change without notice and should not be construed as commitment by Ross Video Limited. Ross Video Limited assumes no responsibility or liability for errors or inaccuracies that may appear in this manual.

Trademarks

- ROSS is a registered trademark of Ross Video Limited.
- Ross, ROSS, ROSS® are registered trademarks of Ross Video Limited.
- openGear® is a registered trademark of Ross Video Limited.
- DashBoard Control System™ is a trademark of Ross Video Limited.
- Dolby® is a registered trademark of Dolby Laboratories.
- All other product names and any registered and unregistered trademarks mentioned in this guide are used for identification purposes only and remain the exclusive property of their respective owners.

Important Regulatory and Safety Notices

Before using this product and any associated equipment, refer to the "**Important Safety Instructions**" listed below to avoid personnel injury and to prevent product damage.

Products may require specific equipment, and/or installation procedures to be carried out to satisfy certain regulatory compliance requirements. Notices have been included in this publication to call attention to these specific requirements.

Symbol Meanings

This symbol on the equipment refers you to important operating and maintenance (servicing) instructions within the Product Manual Documentation. Failure to heed this information may present a major risk of damage or injury to persons or equipment.

Warning — *The symbol with the word "**Warning**" within the equipment manual indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.*

Caution — *The symbol with the word "**Caution**" within the equipment manual indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.*

Notice — *The symbol with the word "**Notice**" within the equipment manual indicates a situation, which if not avoided, may result in major or minor equipment damage or a situation which could place the equipment in a non-compliant operating state.*

ESD Susceptibility — *This symbol is used to alert the user that an electrical or electronic device or assembly is susceptible to damage from an ESD event.*

Important Safety Instructions

Caution — *This product is intended to be a component product of the DFR-8300 series frame. Refer to the DFR-8300 series frame User Manual for important safety instructions regarding the proper installation and safe operation of the frame as well as its component products.*

Warning — *Certain parts of this equipment namely the power supply area still present a safety hazard, with the power switch in the OFF position. To avoid electrical shock, disconnect all A/C power cards from the chassis' rear appliance connectors before servicing this area.*

Warning — *Service barriers within this product are intended to protect the operator and service personnel from hazardous voltages. For continued safety, replace all barriers after any servicing.*
This product contains safety critical parts, which if incorrectly replaced may present a risk of fire or electrical shock. Components contained with the product's power supplies and power supply area, are not intended to be customer serviced and should be returned to the factory for repair. To reduce the risk of fire, replacement fuses must be the same time and rating. Only use attachments/accessories specified by the manufacturer.

EMC Notices

United States of America
FCC Part 15

This equipment has been tested and found to comply with the limits for a class A Digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Notice — *Changes or modifications to this equipment not expressly approved by Ross Video Limited could void the user's authority to operate this equipment.*

CANADA

This Class "A" digital apparatus complies with Canadian ICES-003.

Cet appariel numerique de la classe "A" est conforme a la norme NMB-003 du Canada.

EUROPE

This equipment is in compliance with the essential requirements and other relevant provisions of **CE Directive 93/68/EEC**.

INTERNATIONAL

This equipment has been tested to **CISPR 22:1997** along with amendments **A1:2000** and **A2:2002**, and found to comply with the limits for a Class A Digital device.

Notice — *This is a Class A product. In domestic environments, this product may cause radio interference, in which case the user may have to take adequate measures.*

Maintenance/User Serviceable Parts

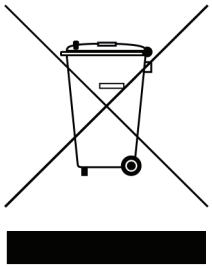
Routine maintenance to this openGear product is not required. This product contains no user serviceable parts. If the module does not appear to be working properly, please contact Technical Support using the numbers listed under the "Contact Us" section on the last page of this manual. All openGear products are covered by a generous 5-year warranty and will be repaired without charge for materials or labor within this period. See the "Warranty and Repair Policy" section in this manual for details.

Environmental Information

The equipment that you purchased required the extraction and use of natural resources for its production. It may contain hazardous substances that could impact health and the environment.

To avoid the potential release of those substances into the environment and to diminish the need for the extraction of natural resources, Ross Video encourages you to use the appropriate take-back systems. These systems will reuse or recycle most of the materials from your end-of-life equipment in an environmentally friendly and health conscious manner.

The crossed-out wheeled bin symbol invites you to use these systems.



If you need more information on the collection, reuse, and recycling systems, please contact your local or regional waste administration. You can also contact Ross Video for more information on the environmental performances of our products.

Company Address

Ross Video Limited
8 John Street
Iroquois, Ontario
Canada, K0E 1K0

Ross Video Incorporated
P.O. Box 880
Ogdensburg, New York
USA 13669-0880

General Business Office: (+1) 613 • 652 • 4886
Fax: (+1) 613 • 652 • 4425

Technical Support: (+1) 613 • 652 • 4886
After Hours Emergency: (+1) 613 • 349 • 0006

E-mail (Technical Support): techsupport@rossvideo.com
E-mail (General Information): solutions@rossvideo.com
Website: http://www.rossvideo.com

Contents

Introduction 1

Overview 1-2
MUX-8258-A Overview 1-2
MUX-8258-C Overview 1-2
Features 1-2
Functional Block Diagrams 1-3
User Interfaces 1-4
DashBoard Control System™ 1-4
Card-edge Controls 1-4
SNMP Monitoring and Control 1-4
Documentation Terms and Conventions 1-5

Installation 2

Before You Begin 2-2
Static Discharge 2-2
Unpacking 2-2
Installing the MUX-8258 2-3
Rear Modules for the MUX-8258-A 2-3
Rear Modules for the MUX-8258-4C 2-3
Rear Modules for the MUX-8258-8C 2-3
Installing a Rear Module 2-3
Installing the MUX-8258 2-4
Cabling for the MUX-8258 2-5
MUX-8258-A Cabling Overview 2-5
MUX-8258-4C Cabling Overview 2-5
MUX-8258-8C Cabling Overview 2-6
Audio Cabling for the MUX-8258-C 2-7
Software Upgrades for the MUX-8258 2-8
Performing Software Upgrades 2-8

User Controls 3

Card Overview 3-2
Control and Monitoring Features 3-3
Status and Selection LEDs on the MUX-8258 3-3
Reference Compatibility 3-5
Frame Rate Compatibility 3-5
Operation Notes 3-6
Audio Proc Amp Controls 3-6
Minimum Delay Overview 3-6
Embedding PCM Signals 3-6
Embedding Non-PCM Signals 3-7
HANC Processing 3-7
VANC Processing 3-7

DashBoard Menus 4

Status Tabs 4-2
Signal Tab 4-2
Product Tab 4-3
Hardware Tab 4-4
Setup Tab 4-5
Input Status Tab 4-7
AES Inputs 1-8 Tabs 4-8
Analog Inputs Tab 4-9
Embedded Outputs Tab 4-10
Alarm Enables Tab 4-11
VANC Processing Tab 4-13

Card-edge Menus 5

Navigating the Card-edge Menus 5-2
Card-edge Menus 5-3
Menu Descriptions 5-5

Specifications 6

MUX-8258-A Technical Specifications 6-2
MUX-8258-C Technical Specifications 6-4
Channel Status Data Table 6-6
Passing the Status Bytes 6-6

Service Information 7

Troubleshooting Checklist 7-2
Bootload Button 7-2
Warranty and Repair Policy 7-3

Introduction

In This Chapter

This chapter contains the following sections:

- Overview
- Functional Block Diagrams
- User Interfaces
- Documentation Terms and Conventions

A Word of Thanks

Congratulations on choosing an openGear **MUX-8258 AES/EBU/Analog Audio Multiplexer**. Your MUX-8258 is part of a full line of Digital Products within the openGear Terminal Equipment family of products, backed by Ross Video's experience in engineering and design expertise since 1974.

You will be pleased at how easily your new MUX-8258 fits into your overall working environment. Equally pleasing is the product quality, reliability and functionality. Thank you for joining the group of worldwide satisfied Ross Video customers!

Should you have a question pertaining to the installation or operation of your MUX-8258, please contact us at the numbers listed on the back cover of this manual. Our technical support staff is always available for consultation, training, or service.

Overview

The MUX-8258 is a high quality program analog multiplexer that is extremely flexible in handling channel assignments and channel re-mapping as well as fully configurative append and overwrite capability for existing channels.

MUX-8258-A Overview

The MUX-8258-A is capable of embedding up to eight AES/EBU pairs (16 audio channels) into an HD/SD-SDI signal. Audio proc control on each input allows for audio processing with independent channel Sample Rate Conversion (SRC), gain of +/-20dB, audio delay up to 1 second and channel phase invert and summing capability. If the input is a synchronous 48kHz signal, the audio can be embedded into the SDI signal unaltered. If the input is not a synchronous 48kHz signal, it may be converted using SRC before it is embedded on the SDI output.

MUX-8258-C Overview

The MUX-8258-C includes one multi-rate SDI input which supports up to 16 channels of embedded audio and four or eight channels of analog audio inputs (MUX-8258-4C and MUX-8258-8C respectively). The MUX-8258-C is capable of embedding up to eight analog audio channels into an HD/SD-SDI signal. Audio proc controls on each input allows for gain control of +/- 10dB, audio delay up to 1 second and channel phase invert and summing capability.

Features

The following features make the MUX-8258 the ideal solution for multiplexing analog audio sources into an HD/SD-SDI signal:

- Supports HD-SD SDI SMPTE-292M, 1.5Gbps and SMPTE 259M, 270Mbps
- MUX-8258-A provides eight AES-3id 75ohm unbalanced inputs with SRC
- MUX-8258-4C provides four analog inputs
- MUX-8258-8C provides eight analog inputs
- MUX-8258-A supports embedding of non-PCM data such as Dolby® Digital and Dolby® E
- One SDI processed output
- Audio embedding for all popular formats (480i, 576i, 720p, and 1080i)
- Full control over channel assignments, primary and backup sources
- Audio proc controls such as gain, invert, delay and sum
- Internally generated test patterns and test tones
- Programmable video output on SDI input loss
- Automatic input video format detection
- Backup audio insertion on audio input loss
- Programmable silence detection and timeout thresholds
- Ability to strip VANC data from specific or all lines of a video output
- Reports status and configuration remotely via the DashBoard Control System™
- Fits DFR-8300 series frames
- 5-year transferable warranty

Functional Block Diagrams

This section provides functional block diagrams that outline the workflow of the MUX-8258.

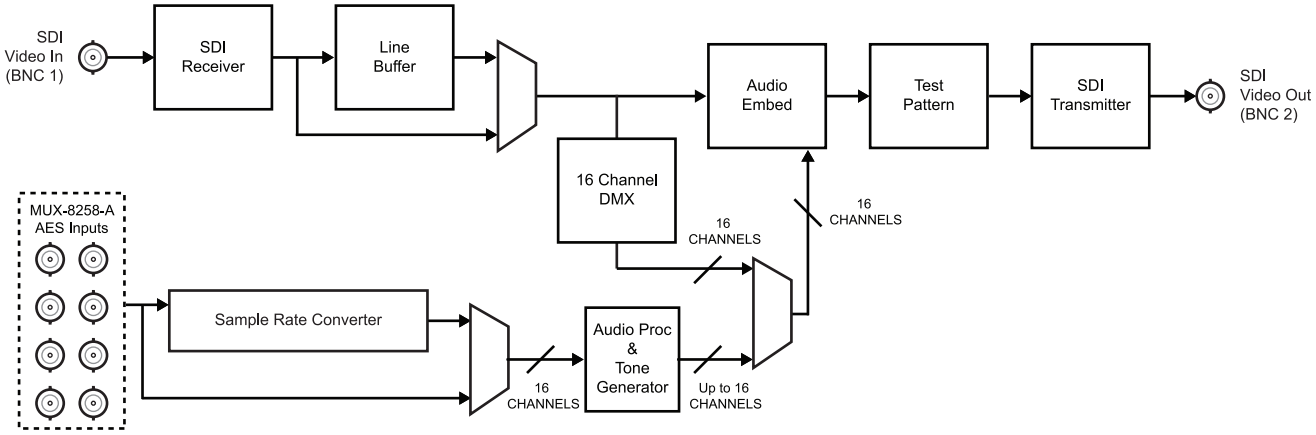


Figure 1.1 *MUX-8258-A — Simplified Block Diagram*

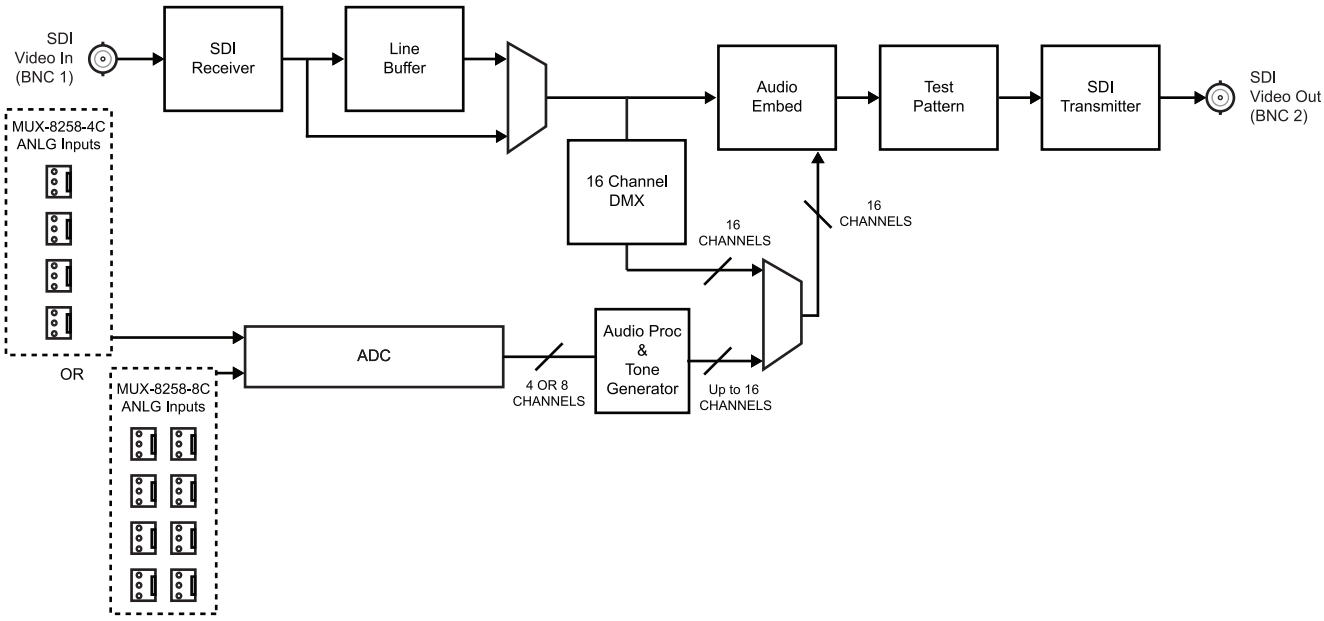


Figure 1.2 *MUX-8258-C — Simplified Block Diagram*

User Interfaces

The MUX-8258 includes three interfaces for control and monitoring for your card.

DashBoard Control System™

The DashBoard Control System™ enables you to monitor and control openGear frames and cards from a computer. DashBoard communicates with other cards in the DFR-8300 series frame through the Network Controller Card. The DashBoard Control System software and manual are available for download from our website.

For More Information...

- on the MUX-8258 menus in DashBoard, refer to the chapter "**DashBoard Menus**" on page 4-1.
- on using DashBoard, refer to the ***DashBoard User Manual*** available from our website.

Card-edge Controls

The front-edge of the MUX-8258 features LED indicators for the power, video input status and communication activity. The card-edge also includes the **SW2** and **SW3** switches that are used in conjunction to navigate the card-edge menu system.

For More Information...

- on the card-edge controls and LEDs, refer to the chapter "**User Controls**" on page 3-1.
- on the card-edge menus, refer to the chapter "**Card-edge Menus**" on page 5-1.

SNMP Monitoring and Control

The Network Controller Card in the DFR-8300 series frame can provide optional support for remote monitoring of your frame and using Simple Network Management Protocol (SNMP), which is compatible with many third-party monitoring and control tools.

For More Information...

- on enabling SNMP Monitoring and Control for your frame, refer to the ***MFC-8300 Series User Manual***.
- on SNMP controls for the MUX-8258, refer to your MUX-8258 Management Information Base (MIB).

Documentation Terms and Conventions

The following terms and conventions are used throughout this manual:

- "**Frame**" refers to DFR-8300 series frame that houses the MUX-8258, as well as any openGear frames.
- All references to the **DFR-8300 series frame** also includes all version of the 10-slot and 20-slot frames and any available options unless otherwise noted.
- All references to the **MUX-8258** also includes all versions unless otherwise indicated.
- All references to the **MUX-8258-C** also includes the MUX-8258-4C and MUX-8258-8C unless otherwise noted.
- "**Operator**" and "**User**" refer to the person who uses MUX-8258.
- "**Board**", and "**Card**" refer to openGear terminal devices within openGear frames, including all components and switches.
- "**System**" and "**Video system**" refer to the mix of interconnected production and terminal equipment in your environment.
- "**525-line mode**" refers to broadcast situations using **NTSC** composite (analog) signal reference inputs.
- "**625-line mode**" refers to broadcast situations using **PAL-B** or **PAL-G** composite (analog) signal reference inputs.
- "**PAL**" refers to PAL-B, and PAL-G unless otherwise stated.
- "**Operating Tips**" and "**Note**" boxes are used throughout this manual to provide additional user information.

Installation

In This Chapter

This chapter provides instructions for installing the Rear Modules for the MUX-8258, installing the card into the frame, cabling details, and updating the card software.

The following topics are discussed:

- Before You Begin
- Installing the MUX-8258
- Cabling for the MUX-8258
- Software Upgrades for the MUX-8258

Before You Begin

Before proceeding with the instructions in this chapter, ensure that your DFR-8300 series frame is properly installed according to the instructions in the ***DFR-8300 Series User Manual***.

Static Discharge

Throughout this chapter, please heed the following cautionary note:

ESD Susceptibility — *Static discharge can cause serious damage to sensitive semiconductor devices. Avoid handling circuit boards in high static environments such as carpeted areas and when synthetic fiber clothing is worn. Always exercise proper grounding precautions when working on circuit boards and related equipment.*

Unpacking

Unpack each MUX-8258 you received from the shipping container and ensure that all items are included. If any items are missing or damaged, contact your sales representative or Ross Video directly.

Installing the MUX-8258

This section outlines how to install a Rear Module in a DFR-8300 series frame. The same procedure applies regardless of the frame or card type. However, the specific Rear Module you need to install depends on your application and the openGear frame you are using.

Rear Modules for the MUX-8258-A

When installing the MUX-8258-A:

- **DFR-8310 series frame** — The **8310AR-030** (R1A-8258) Rear Module is required. The MUX-8258-A is also compatible with the DFR-8310-BNC frame (with the cooling fan option installed).
- **DFR-8321 series frame** — The **8320AR-030** Full Rear Module (R2A-8258) is required.

Rear Modules for the MUX-8258-4C

When installing the MUX-8258-4C:

- **DFR-8310 series frame** — The **8310AR-034** Rear Module (R1C-8258) is required. Note that the MUX-8258-4C is not compatible with the DFR-8310-BNC frame
- **DFR-8321 series frame** — The **8320AR-034** Full Rear Module (R2C-8258) is required.

Rear Modules for the MUX-8258-8C

When installing the MUX-8258-8C:

- **DFR-8310 series frame** — The **8310AR-034** Rear Module (R1C-8258) is required. Note that the MUX-8258-8C is not compatible with the DFR-8310-BNC frame
- **DFR-8321 series frame** — The **8320AR-034** Full Rear Module (R2C-8258) is required.

Installing a Rear Module

If the Rear Module is already installed, proceed to the section "**Installing the MUX-8258**" on page 2-4.

Use the following procedure to install a Rear Module in your DFR-8300 series frame:

1. Locate the card frame slots on the rear of the frame.
2. Remove the Blank Plate from the slot you have chosen for the MUX-8258 installation.
3. Install the bottom of the Rear Module in the **Module Seating Slot** at the base of the frame's back plane. (**Figure 2.1**)

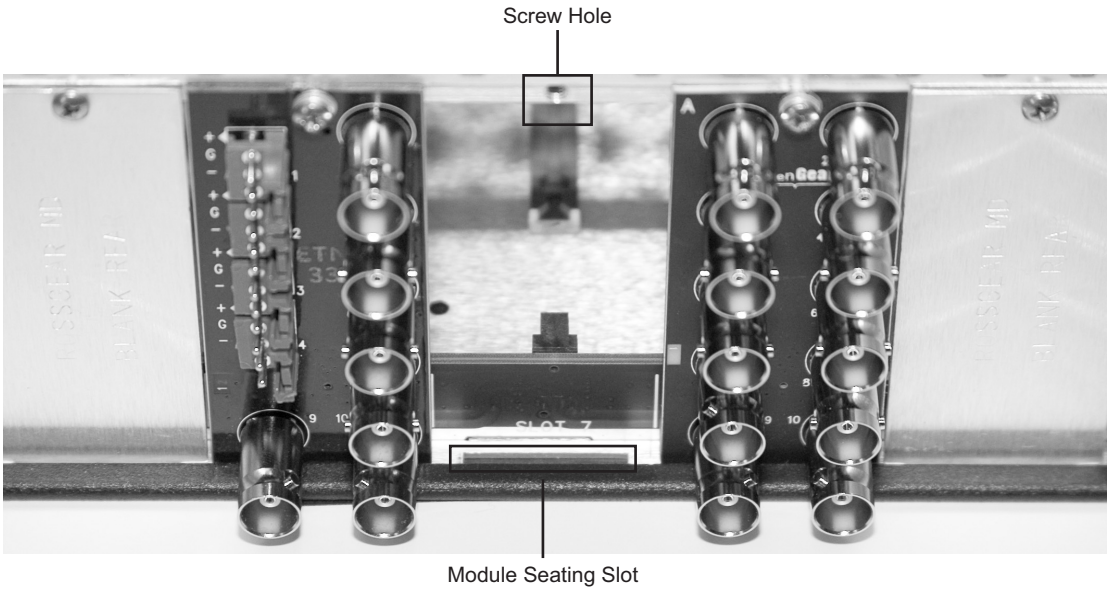


Figure 2.1 *Rear Module Installation in a DFR-8310 Series Frame (MUX-8258 not shown)*

4. Align the top hole of the Rear Module with the screw on the top-edge of the frame back plane.
5. Using a Phillips screwdriver and the supplied screw, fasten the Rear Module to the back plane of the frame. Do not over tighten.
6. Ensure proper frame cooling and ventilation by having all rear frame slots covered with Rear Modules or Blank Plates.

This completes the procedure for installing a Rear Module in your DFR-8300 series frame.

Installing the MUX-8258

This section outlines how to install the MUX-8258 in a DFR-8300 series frame. If the MUX-8258 is to be installed in any compatible frame other than a Ross Video product, refer to the frame manufacturer's manual for specific instructions.

Caution — *Do not populate Slot 10 in the DFR-8310 series frame with an MUX-8258-C. Attempting to populate Slot 10 may damage the MFC-8300 series Frame Controller card, the MUX-8258-C, or both.*

Use the following procedure to install the MUX-8258 in a DFR-8300 series frame:

1. Locate the Rear Module you installed in the procedure "**Installing a Rear Module**" on page 2-3.
2. Hold the MUX-8258 by the edges and carefully align the card-edges with the slots in the frame.
3. Fully insert the card into the frame until the rear connection plus is properly seated in the Rear Module.
4. Verify whether your Rear Module Label is self-adhesive by checking the back of the label for a thin wax sheet. You must remove the wax sheet before affixing the label.
5. Affix the supplied Rear Module Label to the BNC area of the Rear Module.

This completes the procedure for installing the MUX-8258 in a DFR-8300 series frame.

Cabling for the MUX-8258

This section provides information for connecting cables to the installed Rear Modules on the DFR-8300 series frames. Connect the input and output cables according to the following sections.

MUX-8258-A Cabling Overview

The MUX-8258-A accommodates eight synchronous AES audio input streams at 48kHz or any asynchronous AES streams from 32kHz to 96kHz with SRC enabled. Note that SRC should only be used with Pulse Code Modulation (PCM) digital audio and not any form of compressed signal, such as Dolby®.

The MUX-8258-A is used with the following Rear Modules:

- **8310AR-030** Rear Module (R1A-8258) — Each card occupies one slot and provides one SDI input, one SDI output and eight unbalanced AES inputs. (**Figure 2.2**)
- **8320AR-030** Full Rear Module (R2A-8258) — Each card occupies two slots and provides one SDI input, one SDI output, and eight unbalanced AES inputs. (**Figure 2.2**)

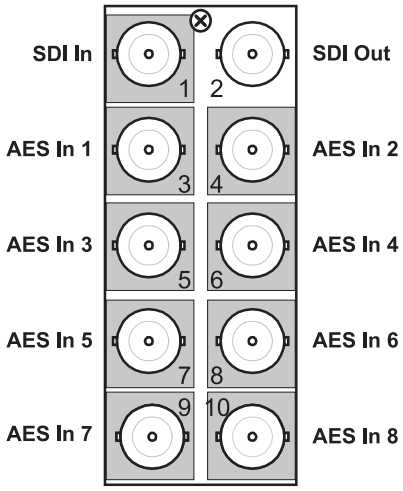


***Figure 2.2** Cable Connections for the MUX-8258-A*

MUX-8258-4C Cabling Overview

The MUX-8258-4C is used with the following Rear Modules:

- **8310AR-034** Rear Module (R1C-8258) — Each card occupies one slot and provides one SDI input, one SDI output and four analog inputs. (**Figure 2.3**)
- **8320AR-034** Rear Module (R2C-8258) — Each card occupies one slot and provides one SDI input, one SDI output, and four analog inputs. (**Figure 2.3**)

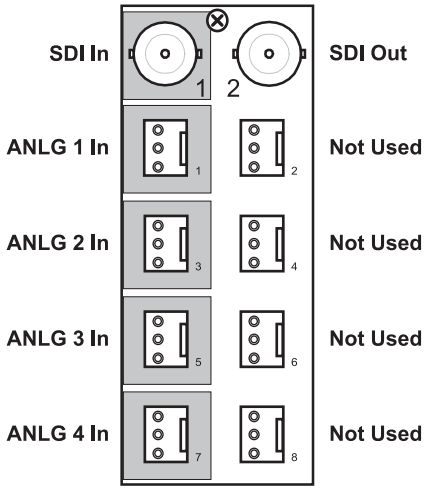


Figure 2.3 *Cable Connections for the MUX-8258-4C*

MUX-8258-8C Cabling Overview

In the DFR-8321 series frames, the MUX-8258 is used with the following Rear Modules:

- **8310AR-034** Rear Module (R1C-8258) — Each card occupies one slot and provides one SDI input, one SDI output, and eight analog inputs. (**Figure 2.4**)
- **8320AR-034** Rear Module (R2C-8258) — Each card occupies one slot and provides one SDI input, one SDI output, and eight analog inputs. (**Figure 2.4**)

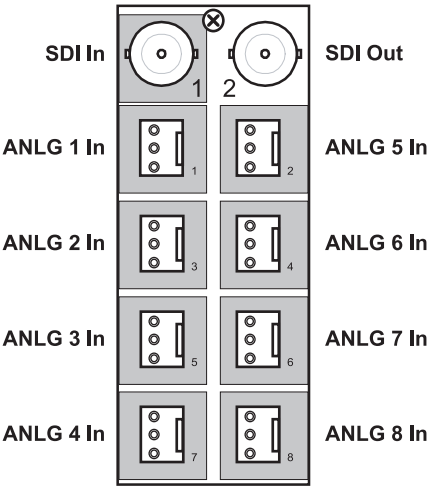


Figure 2.4 *Cable Connections for the MUX-8258-8C*

Audio Cabling for the MUX-8258-C

The 8310AR-034 and 8320AR-034 Rear Modules provide WECO™ audio terminal blocks with removable connectors. Each connector has locations for the positive, negative, and grounded wires of a balanced analog audio cable.

Use the following procedure to wire the analog audio for the MUX-8258-C:

1. Insert an analog audio wire to the designated polarity slot on the connector of the rear module. (**Figure 2.5**)

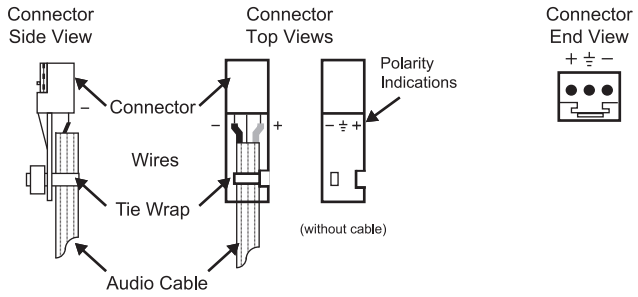


***Figure 2.5** Connector Wiring for Rear Module Input Sockets*

2. Use a tweaker screwdriver to tighten the corresponding capture screw.
3. Repeat steps 1 and 2 for each wire on each connector.
4. Once the cables are wired to the connectors, install the connectors on the terminal blocks for the rear module.

This completes the procedure for wiring the analog audio for the MUX-8258-C.

Software Upgrades for the MUX-8258

This section provides instructions for upgrading the software for your MUX-8258 using the DashBoard Control System™.

Performing Software Upgrades

DashBoard enables you to upload software updates to the MUX-8258.

Use the following procedure to upload software to the MUX-8258:

1. Contact Ross Technical Support for the latest software version file.
2. In DashBoard, display the **Device** tab of the MUX-8258 by double-clicking its status indicator in the **Basic Tree View**.
3. From the **Device** tab, click **Upload** to display the **Select File for upload** dialog box.
4. Navigate to the *.bin upload file you wish to upload. DashBoard automatically selects the last directory that you loaded from.
5. Click **Open** to display a confirmation dialog box. This dialog box displays the selected upload file name, type, size, and the file creation date.
6. From the **Confirmation** dialog box, select one of the following:
   - **Cancel** — Select this option to cancel the upload of the file and return to the **Device View**.
   - **Continue** — Select this option to upload the file. While uploading, an **Uploading Progress** dialog box opens.

Notice — *Clicking the **Cancel** button while uploading will leave the card in an invalid state. Do not click **Cancel** unless the uploading progress has stopped completely for 60 seconds or more.*

7. Monitor the upgrade progress bar displayed in DashBoard while the software is upgraded on your MUX-8258.
8. To complete the upgrade process, you must reboot the card as follows:
   - From the **Device** tab, click **Reboot** to reboot MUX-8258. The reboot process takes up to 30 seconds.

Note — *The communications processor of the MUX-8258 requires approximately 30 seconds to re-start and re-establish network communications.*

   - The MUX-8258 automatically saves all your settings before starting the reboot process.
   - The status of all the cards in the frame are grayed out until the reboot process is complete.

This completes the procedure for uploading software to the MUX-8258.

User Controls

In This Chapter

This chapter provides a general overview of the user controls available on the MUX-8258.

The following topics are discussed:

- Card Overview
- Control and Monitoring Features
- Reference Compatibility
- Operation Notes

Card Overview

This section provides a general overview of the MUX-8258 components. For information on the LEDs available on the card-edge, refer to the section "**Control and Monitoring Features**" on page 3-3.

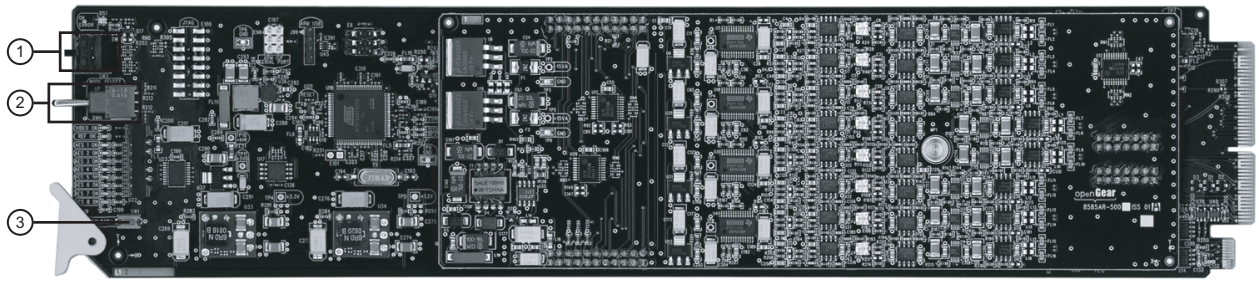


Figure 3.1 *MUX-8258 — Card-edge Components*

1) Function Select Switch (**SW2**)	2) Mode Select Switch (**SW3**)	3) Bootload Button (**SW1)**

1. Function Select Switch (SW2)

Use **SW2** to select general operation functions and menu items and works in conjunction with the Mode Select Switch (**SW3**).

2. Mode Select Switch (SW3)

Use **SW3** to enable, disable, and select specific configurations within the operational function modes menu (selected first with **SW2**).

3. Bootload Button (SW1)

SW1 is used for factory service in the unlikely event of a complete card failure. Do not press this button unless instructed to do so by Ross Technical Support personnel.

For More Information...

- on using the **SW2** and **SW3** switches, refer to the section "**Navigating the Card-edge Menus**" on page 5-2.
- on the LEDs located on the card-edge, refer to the section "**Status and Selection LEDs on the MUX-8258**" on page 3-3.

Control and Monitoring Features

This section provides information on the card-edge LEDs for the MUX-8258. Refer to **Figure 3.2** for the location of the LEDs and controls.

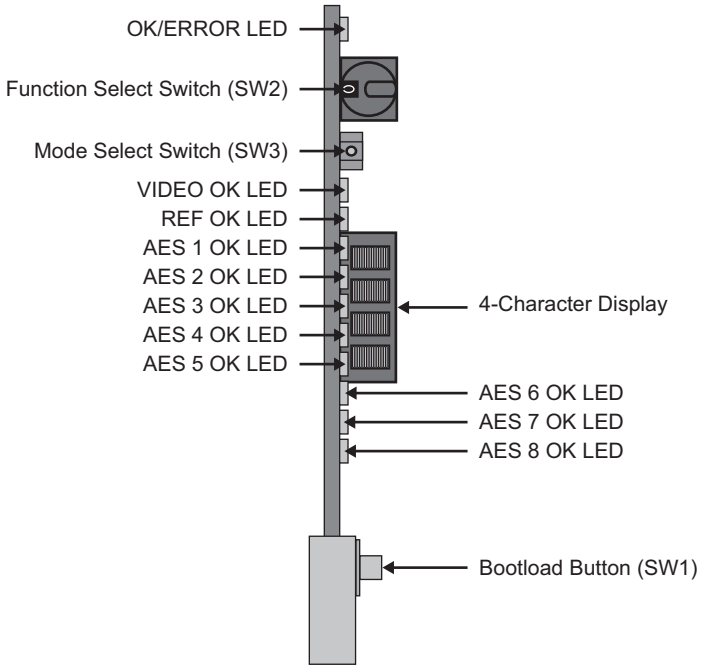


***Figure 3.2** MUX-8258 Card-edge Controls*

Status and Selection LEDs on the MUX-8258

Basic LED displays and descriptions are provided in **Table 3.1**.

Table 3.1 LEDs on the MUX-8258

LED	Color	Display and Description
OK/ERROR	Green	When lit green, this LED indicates that the card is functioning normal and that no anomalies have been detected. The following conditions must be satisfied: • a valid input signal is present • a valid reference signal is present when a reference is required, and that the reference standard matches the input standard.
	Flashing Green	When flashing green, this LED indicates the bootloader is waiting for a software upload.
	Flashing Green and Orange	When lit green with flashing orange, this LED indicates there is a signal error such as a missing or invalid input or reference.
	Orange	When lit orange, this LED indicates the card is powering on.
	Red	When lit red, this LED indicates the card is not operational.
	Off	When off, this LED indicates there is no power to the card.

Table 3.1 LEDs on the MUX-8258

LED	Color	Display and Description
VIDEO OK	Green	When lit, this LED indicates that the video input is valid.
	Flashing Green	When flashing, this LED indicates that video is present, but the input format is unsupported.
	Off	When unlit, this LED indicates the absence of an input signal.
REF OK	Green	When lit green, this LED indicates a valid reference signal.
	Flashing Green	When flashing, this LED indicates that the reference signal is present but the format is invalid.
	Off	When unlit, this LED indicates that a reference signal is not present, or is not supported.
AES # OK	Orange	MUX-8258-A— When lit, an LED indicates a valid signal is detected on the corresponding AES input. MUX-8258-C — When lit, an LED indicates that the analog audio is present.

Reference Compatibility

It is important to remember that if you are using **Frame 1** or **Frame 2** as the reference, the input video frame rate must match the reference frame rate.

Frame Rate Compatibility

Refer to **Table 3.2** for frame rate compatibility.

Table 3.2 Compatible Video Formats

Reference	Output					
	480i/59.94	720p/59.94	1080i/59.94	576i/50	1080i/50	720p/50
480i/59.94	✓	✓	✓			
720p/59.94	✓	✓	✓			
1080i/59.94	✓	✓	✓			
576i/50				✓	✓	✓
720p/50				✓	✓	✓
1080i/50				✓	✓	✓

Operation Notes

This section provides brief notes when operating the MUX-8258.

Audio Proc Amp Controls

The MUX-8258 includes Processing Amplifiers (Proc Amps) for the audio inputs on the card. Note that these features are not available when using the card-edge controls.

Proc Amp adjustments are applied in the following order:

1. **Sum** — This option enables both channels to carry the average of the two input channels (A+B/2). When the input is summed, the original signals are no longer available for output. This option only operates with AES input pairs.
2. **Delay** — This option enables you to adjust the delay of the audio channel. If you have enabled the Delay Lock feature, changing the delay value for one channel automatically changes the value for the other channel.
3. **Gain** — This option provides a +/- 20dB gain range in 1dB increments. If you have enabled the Gain Lock feature, changing the gain value for one channel automatically changes the value for the other channel. When using the MUX-8258-C, the gain range is +/- 10dB.
4. **Invert** — This option enables you to invert the polarity of the audio signal for the selected channel.

Minimum Delay Overview

The line buffer stores incoming video in relation to the incoming video clock timing. The video data is then read out in relation to the reference timing. This allows the input video to be switched between sources that may not be perfectly timed without timing glitches. Video source timing must remain within the buffer window to properly switch between sources. **Table 3.3** provides information on the buffer window available depending on how the Minimum Delay feature is configured in DashBoard.

Table 3.3 Minimum Delay

If the option is...	Format	Minimum Delay	Maximum Delay
Disabled	HD	1/4 line	1/2 line
	SD	1/4 line	1/2 line
Enabled	HD	1/16 line	1/8 line
	SD	1/8 line	1/4 line

Embedding PCM Signals

The MUX-8258-A can embed PCM audio from two sources: the AES input or from the embedded audio of the source video. The MUX-8258-C can embed from two sources: the analog input or from the embedded audio of the source video. Processing also includes embedding channel status data as per **Table 6.3**.

Embedding Non-PCM Signals

You can configure the MUX-8258-A to embed non-PCM signals, such as Dolby® Digital and Dolby® E, using the options available in DashBoard. However, when embedding the non-PCM signal, the A&B channels of the input signal must be embedded on Channels 1 and 2, or Channels 3 and 4 of a given group. For example, you would embed AES1A in G1Ch1, and AES1B in G1Ch2.

To configure the MUX-8258-A to embed non-PCM signals:

1. Display the **Device View** in DashBoard for the MUX-8258-A you wish to configure.
2. Select the **AES Inputs** tab for the input channel you wish to configure.
3. Set the **Sample Rate Conversion** to **Off**.
4. Clear the **Sum** checkbox to disable channel summing.
5. Set the **Channel Gain** to **0**.
6. Clear the applicable **Ch Invert** checkbox to disable inverting on the channel.

HANC Processing

SMPTE 291M formatted ancillary packets, such as SMPTE 12M-2 (timecode), that are found in the Luma portion (Y stream) of the HANC in an HD video signal (other than audio related packets) will be passed from input to output.

VANC Processing

The **VANC Processing** tab in DashBoard provides options for replacing the full active portion of selected lines of video with black.

The **VANC Processing** tab is divided into separate sub-tabs for each format (1080p, 1080i, 720p, 576i, and 480i) to provide selection of the lines. This enables you to individually select any combination of lines, from line 1 up to the third line after the VI for the current video format. For interlaced formats, the lines in the two fields are separately configured. **Table 3.4** lists the allowable line selections based on format.

Table 3.4 VANC Processing — Line Selection

Format	Field 1 Lines	Fields 2 Lines
1080p	1-44	-
1080i	1-23	562-586
720p	1-28	-
576i	1-25	313-338
480i	1-23	264-285

To delete the VANC components in a line:

1. Display the **Device View** in DashBoard for the MUX-8258 you wish to configure.
2. Select the **VANC Processing** tab.
3. Select the sub-tab, located at the bottom of the **VANC Processing** tab, for the applicable video format.

4. In the **Line** column, locate the line you wish to delete the VANC components for. Notice for interlaced formats that the **Line** column on the left lists the lines in **Field 1**, and the **Line** column on the right lists the lines in **Field 2**.

5. To delete the VANC components:

   - **for a specific line** — select **Strip** for that line. The default for each line is **Pass**.
   - **for all lines of a video format** — click the **Strip** button located near the bottom of the applicable sub-tab.

Operating Tip — *To pass the VANC components without modification for all lines in a specific video format, click the **Pass** button located near the bottom of the sub-tab.*

DashBoard Menus

In This Chapter

This chapter briefly summarize the menus, items, and parameters available from the DashBoard Control System™ for the MUX-8258. Parameters marked with an asterisk (*) are the factory default values.

The following topics are discussed:

- Status Tabs
- Setup Tab
- Input Status Tab
- AES Inputs 1-8 Tabs
- Analog Inputs Tab
- Embedded Outputs Tab
- Alarm Enables Tab
- VANC Processing Tab

Status Tabs

This section summarizes the read-only information displayed in the Status tabs. The fields in the **Signal** tab vary in severity from green (valid), yellow (caution), to red (alarm). DashBoard reports the most severe alarm for a single field.

Signal Tab

Table 4.1 summarizes the **Signal** tab parameters available in DashBoard for the MUX-8258.

Table 4.1 Signal Tab Items

Tab Title	Item	Parameters	Description
General (Read-only)	Signal Status	OK	Indicates when the card is functioning normally or if anomalies are detected
		Invalid Format	
		Incompatible	
		Non-Sync Video	Indicates when the card is functioning normally or if anomalies are detected
		Group Not Present	
		Group Channel Silent	
		AES Input Not Present	
	Audio Status	OK	Indicates the status of the audio source
		Source Missing	
		Source Async	
		AES Input Silent	
		Analog Input Silent	
		Group 4 Reduced to 20bit[a]	
		Backup Source Missing	
		Backup Source Async	
	Reference Status	OK	Indicates that a valid reference source is present
		No Ref - Video	The following conditions are occurring: • Card reference is set to Frame 1 or Frame 2 • A valid reference signal is not present • Card has gone to Video Timing Mode
		No Ref - Free Run	The following conditions are occurring: • Card reference is set to Frame 1 or Frame 2 • A valid reference signal is not present • Card has gone to Free Run Mode
		Invalid Format - Video	Card has detected an invalid[b] reference format and has switched to Video Timing Mode

Table 4.1 Signal Tab Items

Tab Title	Item	Parameters	Description
General (Read-only)	Reference Status	Invalid Format - Free Run	The following conditions are occurring: • Card has detected an invalid[c] reference format • Input video is missing or invalid • Card has switched to Free Run Mode
	Input Format	#	Indicates the input video format
	Reference Format	#	Indicates the reference video format
	Output Format	#	Indicates the output video format
	Embedded Audio Status - Group #	PCM	Indicates the presence of input
		No Input	
		PCM-Silent	
		Non-PCM	
		Async	
		Mixed	
AES Inputs (Read-only)	AES #	PCM	Indicates the presence of input. This tab is only available for the MUX-8258-A.
		No Input	
		PCM-Silent	
		Non-PCM	
		Async	
		Mixed	

a. This parameter indicates that there are more than 3 groups of 24bit SD embedded audio sources.
b. Refer to the section "**Reference Compatibility**" on page 3-5 for a complete list of supported formats.

Product Tab

Table 4.2 summarizes the **Product** tab parameters available in DashBoard for the MUX-8258.

Table 4.2 Product Tab Items

Tab Title	Item	Parameters	Description
Product (Read-only)	Product	MUX-8258-A, or MUX-8258-4C, or MUX-8258-8C	Indicates the product name
	Supplier	Ross Video Ltd.	
	Board Rev	##	Indicates the board version of your card
	Rear Module	#	Type of rear module in the slot
	Board S/N	######	Indicates the board serial number
	Software Rev	##.##	Indicates the software version
	Firmware Rev	#.###	Indicates the firmware version
	Daughter Card Type[a]	##	Indicates if a daughter card is installed.

a. This field is not available when using a MUX-8258-A.

Hardware Tab

Table 4.3 summarizes the **Hardware** tab parameters available in DashBoard for the MUX-8258.

Table 4.3 Hardware Tab Items

Tab Title	Item	Parameters	Description
Hardware (Read-only)	HW Status	OK	Indicates any problems with the card hardware components
		FPGA load invalid	
		Incomp I/O module	
		Current out of spec	
		Internal Error	
	Voltage (mV)	#	Supply Voltage
	Current (mA)	#	Current consumption of card
	CPU Headroom	#	Processing power available
	RAM Available	#/##	On-board processing memory available
	Uptime (h)	#	Displays the number of hours since the last reboot of the card
	Configuration Bank	#	Storage count

Setup Tab

Table 4.4 summarizes the **Setup** options available in DashBoard for the MUX-8258.

Table 4.4 Setup Menu Items

Menu Title	Item	Parameters	Description
Setup	Reference	Frame 1*	Selects the reference source
		Frame 2	
		Video	
	Minimum Delay	Selected	Provides the shortest video delay through the card. Refer to **Table 3.3** on page 3-6 for delay specifications.
		Cleared*	The total video delay through the card will be the values above plus half a video line
	Loss of Input	Black	Configures the output in the event of a loss of video input
		Blue	
		Custom*	Sets the output to a custom color in the event of a loss of video input. Use the Y, Cr, and Cb sliders to configure the color.
		Y slider	Sets the luminance component of the Loss of Input Custom video signal
		Cr slider	Sets the Cr component of the Loss of Input Custom video signal
		Cb slider	Sets the Cb component of the Loss of Input Custom video signal
	Test Pattern	None*	Disables the test pattern feature
		100% Color Bars	Specifies the type of test pattern to output. Note that this setting is not retained on power down.
		Frequency Sweep	
		Black	
		Blue	
		Matrix Pathological	
		Luma Ramp	
		Y/C Ramp	
		75% SMPTE Bars	
	SD Audio	20 Bit*	Embeds 20bits
		24 Bit	Embeds 24bits
		Auto	Embeds 20-24bit depending on the audio source and the number of bits
	Silence Threshold (dB)	-96 to 0	Audio below the specified threshold value is considered silent
	Silence Timeout (sec)	1 to 60	Audio silent for longer than the specified value raises an alarm

Table 4.4 Setup Menu Items

Menu Title	Item	Parameters	Description
Setup	Edit Permission	Unlocked*	All menu options are unlocked and can be edited
		Locked	All menu items, except this one, are locked and read-only
	All Audio	Reset	Resets the parameters in the Audio Inputs and Embedded Audio Outputs tabs to factory defaults
	Factory Defaults	Reset	Resets all parameters to factory defaults

Input Status Tab

Table 4.5 summarizes the **Input Status** options available in DashBoard.

Table 4.5 Input Status Menu Items

Menu Title	Item	Parameters	Description
Video Input & Embed	Input Format (read-only)	#	Displays the format of the video input
	CRC Errors (read-only)	#	Displays the count of the CRC errors on the video input. This 14bit counter is reset on loss of video, or by user request. The counter is non-latching, and will rollover from maximum count to zero. • For SD formats, it displays both active picture and full frame errors. • For HD formats, it displays the total count of errors.
	Error Count	Reset	Resets the CRC Errors field
	Embedded Audio Group # Channel # (read-only)	PCM	Displays the status of each group and channel of embedded audio
		No Input	
		PCM-Silent	
		Non-PCM	
		Async	
		Mixed	
	Word Length (read-only)	#bit	Displays the word length of the audio in number of bits
Audio - AES # (MUX-8258-A)	Ch A Status (read-only)	No Input	Displays the status of the Channel A input
		PCM	
		PCM-silent	
		Non-PCM	
		Async[a]	
	Ch B Status	Same as above	
	Word Length (read-only)	#bit	Displays the number of bits of audio
	Emphasis (read-only)	Present	The incoming AES signal is indicating 50/15 or CCiTT J.17 emphasis
		Not Present	The incoming AES signal is indicating no emphasis or the emphasis is not indicated
	Sample Rate (read-only)	#	Displays the sample rate of the AES input
Audio - Input # (MUX-8258-C)	Status (read-only)	OK	Displays the status of the input
		Silent	
		Clipped[b]	

a. If the SRC is ON, an Async AES signal is processed to be PCM and indicated as such.
b. Indicates that the audio levels are too high.

AES Inputs 1-8 Tabs

Table 4.6 summarizes the **AES Inputs 1-4** and **AES Inputs 5-8** options available in DashBoard for the MUX-8258-A.

Table 4.6 AES Inputs Menu Items

Menu Title	Item	Parameters	Description
AES #	Sum	Selected	Both channels will carry the average of the two input channels (A+B/2). When the input is summed, the original signals are no longer available for output.
		Cleared*	Disables this feature
	Sample Rate Conversion	Off	SRC is not used on an input. Select this option when using non-PCM audio data
		On*	SRC is used on an input
	Ch # Delay (ms)	0* to 1000	Adjusts the delay of the specified audio channel
	Delay Lock	Selected*	Locks the Delay slider of both channels together. If the values for the two channels are different, that change is maintained when the channels are locked.
		Cleared	The Delay slider is unlocked
	Ch # Gain (dB)	-20 to +20[a]	Adjusts the gain of the specified audio channel
	Gain Lock	Selected*	Locks the Gain slider of both channels together. If the values for the two channels are different, that change is maintained when the channels are locked.
		Cleared	The Gain slider is unlocked
	Ch # Invert	Selected	Inverts the audio signal of the specified channel
		Cleared*	The audio signal is not inverted
	Input	Reset	Resets the parameters for the selected input to the default values
	Inputs #-#	Reset	Resets the indicated input parameters to the default values

a. The default value is 0.

Analog Inputs Tab

Table 4.7 summarizes the **Analog Inputs 1-4** and **Analog Inputs 5-8** options available in DashBoard for the MUX-8258-4C and MUX-8258-8C.

Table 4.7 Analog Inputs Menu Items

Menu Title	Item	Parameters	Description
Input #	Delay (ms)	0* to 1000	Adjusts the audio delay for the specified input
	Gain (dB)	-10 to +10[a]	Adjusts the audio gain for the specified input
	Invert	Selected	Inverts the audio signal of the channel
		Cleared*	The audio signal is not inverted
	Input	Reset	Resets the parameters for the selected input to the default values

a. The default value is 0.

Embedded Outputs Tab

Table 4.8 summarizes the **Embedded Outputs** options available in DashBoard.

Table 4.8 Embedded Outputs Menu Items

Menu Title	Item	Parameters	Description
Group #	Enable	Selected*	Determines if the group is inserted in the output or not
		Cleared	
	Ch # Source	Mute	Configures the Primary Source that is inserted in to the embedded group if present
		Group# Ch#*	
		AES #[a]	
		Analog 1 to #[b]	
		#Hz Tone	
		#kHz Tone	
	Ch # Backup Source	Mute	Configures the Backup Source that is inserted when the Primary Source is unavailable
		Group# Ch#	
		AES #[a*]	
		Analog 1 to #[b*]	
		#Hz Tone	
		#kHz Tone	
	Presets	Pass	Configures the group source settings with the original group as the Primary Source and mute as the Backup Source
		Insert*	Configures the group source settings with the original group as the Primary Source, and AES inputs as the Backup Source
		Overwrite	Configures the group source settings with AES inputs as the Primary Source, and embed as the Backup Source

a. These values are only available when using an MUX-8258-A.

b. The values are dependent on the card. If you are using an MUX-8258-4C, you can choose from Analog 1 to 4. If you are using an MUX-8258-8C, you can choose from Analog 1 to 8.

Alarm Enables Tab

Table 4.9 summarizes the **Alarm Enables** options available in DashBoard.

Table 4.9 Alarms Menu Items

Menu Title	Item	Parameters	Description
Video Input & Reference Alarm	No Input	Selected*	Signal Status field reports a loss of input
		Cleared	Disables the alarm
	Invalid Input	Selected*	Input Format field reports when the input video is a format that is not accepted
		Cleared	Disables the alarm
	Incompatible Input	Selected*	Input Format field reports when the frame rate is not the same as the reference input
		Cleared	Disables the alarm
	Non-Sync Video	Selected*	Signal Status field reports if the video input is asynchronous to the reference
		Cleared	Disables the alarm
	No Reference	Selected*	Reference Status field reports a loss of input conditions when they occur
		Cleared	Disables the alarm
	Invalid Reference	Selected*	Reference Format field reports when the reference is a format that is not supported
		Cleared	Disables the alarm
Hardware	Incompat Rear Module	Selected*	HW Status field reports when a rear module is not compatible with the card
		Cleared	Disables the alarm
	Incompat Daughter Card[a]	Selected*	HW Status field reports when using an incompatible daughter card
		Cleared	Disables the alarm
Embedded Input Audio - Group #	Group not present	Selected*	Signal Status field reports when a group is not present on the input
		Cleared	Disables the alarm
	Channel # Silent	Selected*	Signal Status field reports when the specified channel is detected as silent
		Cleared	Disables the alarm
AES Inputs - AES # (MUX-8258-A)	Input not present	Selected*	Signal Status field reports when the AES input is not detected
		Cleared	Disables the alarm
	Channel # Silent	Selected*	Signal Status field reports when the AES channel is detected as silent
		Cleared	Disables the alarm

Table 4.9 Alarms Menu Items

Menu Title	Item	Parameters	Description
Analog Inputs - ANLG # (MUX-8258-C)	Silent	Selected*	Signal Status field reports when the analog input is detected as silent.
		Cleared	Disables the alarm
Embedded Outputs - Group #	Source Missing	Selected*	Embedded Audio Status field reports when the selected source is not present or is silent
		Cleared	Disables the alarm
	Source Async	Selected*	Embedded Audio Status field reports when the selected source is not synchronous to the input video
		Cleared	Disables the alarm
	Backup Source Missing	Selected*	Embedded Audio Status field reports when the selected Backup Source is not present or is silent
		Cleared	Disables the alarm
	Backup Source Async	Selected*	Embedded Audio Status field reports when the selected Backup Source is not synchronous to the input video
		Cleared	Disables the alarm
	SD 24Bit[b]	Selected*	Audio Status field reports when the selected configuration would embed 4 groups of 24bit audio in an SD output. Group 4 is down-sampled to 20bit audio.
		Cleared	Disables the alarm
	All Alarms	Set	Enables all alarms
	All Alarms	Clear	Disables all alarms

a. This alarm is only applicable when using a MUX-8258-C.

b. Note that when performing an analog to digital conversion of audio, the card produces 24bit resolution by default. When converting, ensure that you set the **SD Audio** option in the **Setup** tab to **20bit**. Otherwise, the card will output 24bit and an alarm is raised in the **Audio Status** field.

VANC Processing Tab

Table 4.10 summarizes the **VANC Processing** options available in DashBoard.

Table 4.10 VANC Processing Menu Items

Menu Title	Item	Parameters	Description
480i, 576i, 1080i	Line	#[a]	Indicates the specific line the VANC components will be deleted from
	Field #	Pass*	VANC components are passed unmodified to the card output
		Strip	VANC components are deleted from the card output
720p, 1080p	Line	#[a]	Indicates the specific line the VANC components will be deleted from
	Option	Pass*	VANC components are passed unmodified to the card output
		Strip	VANC components are deleted from the card output
	All Lines	Pass	All VANC components are passed unmodified to the card output
		Strip	All VANC components are deleted from the card output

a. The range is dependent on the format.

Card-edge Menus

In This Chapter

This chapter summarizes the Card-edge Menu system of the MUX-8258 and how to navigate the menus and options using the **SW2** and **SW3** switches on the MUX-8258 card-edge.

The following topics are discussed:

- Navigating the Card-edge Menus
- Card-edge Menus
- Menu Descriptions

Navigating the Card-edge Menus

Use the following procedure to navigate the card-edge menus of the MUX-8258:

1. Locate **SW2** and **SW3** switches on the MUX-8258 card-edge. Refer to **Figure 3.2** on page 3-3 for locations.
2. Rotate **SW2** to the required menu.
3. Toggle **SW3** to select the required parameter.

This completes the procedure for navigating the card-edge menus of the MUX-8258.

Note — *Do not power down the card before ensuring that all edited parameters are saved. Saving edited parameters can take up to 10 seconds.*

Card-edge Menus

Table 5.1 lists all the menus and the default values available using the card-edge controls. To activate some of these parameters, it may be necessary to toggle **SW3** in either direction, or it may require that **SW3** be held in either direction for a few seconds. Note that values noted with an asterisk (*) are the factory default values.

Table 5.1 Card-edge Menus and Items

Menu Select	Card-Edge Menu Label	Menu Name	Card-Edge Item Label	Item Name
0	MUX-8258-# slot #	Home		
1	Fact Def	Factory Default	n/a	Factory Default
2	Ref Src	Reference Source	Fr 1*	Frame 1 Reference
			Fr 2	Frame 2 Reference
			Vid	Video
3	LOI	Loss of Input	Black	
			Blue	
			Custom*	
4	Test Patt	Test Pattern	None*	
			75%	SMPTE Bars
			YC Ramp	Y/C Ramp
			L Ramp	Luma Ramp
			Matr Path	Matrix Pathological
			Blue	Flat Field Blue
			Black	Flat Field Black
			Frq Swp	Frequency Sweep
			100%	100% Full Field Bars
5	Grp Sel	Group Select	Grp 1*	Group 1
			Grp 2	Group 2
			Grp 3	Group 3
			Grp 4	Group 4
6	Grp Enbl	Group Enable	Grp Enbl*	Group Enabled
			Grp Dsbl	Group Disabled

Table 5.1 Card-edge Menus and Items

Menu Select	Card-Edge Menu Label	Menu Name	Card-Edge Item Label	Item Name
7	Ch1 Src	Channel 1 Source	Mute	
			T4k	4kHz Tone
			T2k	2kHz Tone
			T1k	1kHz Tone
			T.5k	500Hz Tone
			A1A* - A8B	AES 1A to AES 8B (MUX-8258-A)
			Alg1 - Alg4	Analog 1 to Analog 4 (MUX-8258-4C)
			Alg1 - Alg8	Analog 1 to Analog 8 (MUX-8258-8C)
			G1C1-G4C4	Group 1, Channel 1 to Group 4, Channel 4
8	Ch2 Src	Channel 2 Source	Same as above	
9	Ch3 Src	Channel 3 Source	Same as above	
A	Ch4 Src	Channel 4 Source	Same as above	
B	Ch1 Bkp	Channel 1 Backup Source	Mute	
			T4k	4kHz Tone
			T2k	2kHz Tone
			T1k	1kHz Tone
			T.5k	500Hz Tone
			A1A - A8B	AES 1A to AES 8B
			Alg1 - Alg4	Analog 1 to Analog 4 (MUX-8258-4C)
			Alg1 - Alg8	Analog 1 to Analog 8 (MUX-8258-8C)
			G1C1-G4C4	Group 1, Channel 1 to Group 4, Channel 4
C	Ch2 Bkp	Channel 2 Backup Source	Same as above	
D	Ch3 Bkp	Channel 3 Backup Source	Same as above	
E	Ch4 Bkp	Channel 4 Backup Source	Same as above	

Menu Descriptions

This section briefly summarizes the menu parameters available in the card-edge display.

0 — Home

This read-only menu displays the product name and the slot the card is installed in the frame.

1 — Factory Defaults

This function enables you to return all controls to their factory default values. Use the following procedure to reset the card parameters to factory default values using the card-edge controls:

1. Rotate **SW2** to **1**. The Four Character Display displays "**Fact Def**".
2. Toggle **SW3** down and hold for 3 seconds.
3. Release **SW3**.

2 — Reference Source

This menu enables you to select where the card will look for a reference. The choices are Frame Reference 1 (**Fr 1**), Frame Reference 2 (**Fr 2**), and Video (**Vid**). Refer to the section "**Reference Compatibility**" on page 3-5 for a list of supported formats.

3 — Loss of Input

Use this menu to select what type of video displays at the system's outputs when the input video signal is lost or invalid.

4 — Test Pattern

This menu enables you to specify the type of test pattern to output. Note that this setting is not retained on power down.

5 — Group Select

This menu enables you to select the embedded group before enabling the group, assigning sources to the channels, and backup sources. This menu is used in conjunction with Menus 6 to E.

6 — Group Enable

Use this menu to determine if the selected group is embedded in the output or not.

7, 8, 9, A — Channel # Source

Use Menus 7 to A to configure the Primary Source that is inserted into the embedded group if present. These menus are used in conjunction with Menu 5 (Group Select). The following are the default values based on the group selected:

Table 5.2 Primary Source Default Values

SW1-5	SW1-7	SW1-8	SW1-9	SW1-A
G1	G1C1	G1C2	G1C3	G1C4
G2	G2C1	G2C2	G2C3	G2C4
G3	G3C1	G3C2	G3C3	G3C4
G4	G4C1	G4C2	G4C3	G4C4

B, C, D, E — Channel # Backup Source

Use Menus B to E to configure the Backup Source that is inserted when the Primary Source is unavailable. This menu is used in conjunction with Menu 5 (Group Select).

The following are the MUX-8258-A default values based on the group selected:

Table 5.3 MUX-8258-A Backup Source Default Values

SW1-5	SW1-B	SW1-C	SW1-D	SW1-E
G1	A1A	A1B	A2A	A2B
G2	A3A	A3B	A4A	A4B
G3	A5A	A5B	A6A	A6B
G4	A7A	A7B	A8A	A8B

The following are the MUX-8258-4C default values based on the group selected:

Table 5.4 MUX-8258-4C Backup Source Default Values

SW1-5	SW1-B	SW1-C	SW1-D	SW1-E
G1	Alg1	Alg2	Alg3	Alg4
G2	Alg1	Alg2	Alg3	Alg4
G3	Alg1	Alg2	Alg3	Alg4
G4	Alg1	Alg2	Alg3	Alg4

The following are the MUX-8258-8C default values based on the group selected:

Table 5.5 MUX-8258-8C Backup Source Default Values

SW1-5	SW1-B	SW1-C	SW1-D	SW1-E
G1	Alg1	Alg2	Alg3	Alg4
G2	Alg5	Alg6	Alg7	Alg8
G3	Alg1	Alg2	Alg3	Alg4
G4	Alg5	Alg6	Alg7	Alg8

Specifications

In This Chapter

This chapter provides technical specification details on the MUX-8258. Note that specifications are subject to change without notice.

The following topics are discussed:

- MUX-8258-A Technical Specifications
- MUX-8258-C Technical Specifications
- Channel Status Data Table

MUX-8258-A Technical Specifications

This section includes the technical specifications for the MUX-8258-A.

Table 6.1 MUX-8258-A Technical Specifications

Category	Parameter	Specification
SDI Input	Number of Inputs	1 HD-SDI input
	SDI Data Rates and SMPTE Standards Accommodated	SMPTE 292M, SMPTE 259M
	Impedance	75ohm
	Return Loss	>15dB to 1.5GHz
	Equalization	Automatic < 300m Belden 1694A cable @ SD rates < 100m (300ft) @ HD rates
	Connector Type	BNC
SDI Output	Number of Outputs	1 HD-SDI
	SDI Data Rates and SMPTE Standards Accommodated	SMPTE 292M, SMPTE 259M
	Impedance	75ohm
	Return Loss	>15dB to 1.5GHz
	Signal Level	800mV, +/- 10%
	DC Offset	<50mV
	Rise and Fall Time (20-80%)	600ps typical @ SD rates 120ps typical @ HD rates
	Overshoot	<10%
	Minimum Video Delay	HD: 2.2us SD: 7us
	Connector Type	BNC
AES Inputs	Number of Inputs	8 AES-3id inputs
	AES Standards Accommodated	AES-3id-2001
	Impedance	75ohm
	Minimum Input	50mV p-p
	Maximum Input	2.5V p-p @ 48kHz 1.5V p-p @ 96kHz

Table 6.1 MUX-8258-A Technical Specifications

Category	Parameter	Specification
AES Inputs	Minimum Audio Delay	SRC on: 1.35mS SRC off: 0.37mS
	Sampling Rate	48kHz compliant with AES-3id or any rate from 32kHz to 96kHz with SRC on
	Equalization	up to 800m (2,400ft) @ 48kHz up to 500m (1,500ft) @ 96kHz
	Connector Type	BNC
Environmental	Operating Range	5°C to 40°C ambient
Power	Total Power Consumption	8.5W

MUX-8258-C Technical Specifications

This section includes the technical specifications for the MUX-8258-4C and MUX-8258-8C.

Table 6.2 MUX-8258-4C and MUX-8258-8C Technical Specifications

Category	Parameter	Specification
Analog Audio Inputs	Number of Inputs	MUX-8258-4C: 4 inputs MUX-8258-8C: 8 inputs
	Input Impedance	> 10KΩ
	Maximum Input Level	+ 24dBu
	Input Level Adjustment	± 10dBu
	Frequency Response	± 0.07dB 22Hz to 20kHz @ Fs = 48kHz
	Signal to Noise Ratio	-96dB -98dB 'A' weighted -104dB CCITT weighting
	THD	> -97dB or < 0.002%
	Phase Linearity	< 1°
	Amplitude Linearity	< 0.6dB @ -100dBFS
	Crosstalk	-95dB
SDI Input	Number of Inputs	1 HD-SDI input
	SDI Data Rates and SMPTE Standards Accommodated	SMPTE 292M, SMPTE 259M
	Impedance	75ohm
	Return Loss	>15dB to 1.5GHz
	Equalization	Automatic < 300m Belden 1694A cable @ SD rates < 100m (300ft) @ HD rates
	Connector Type	BNC
SDI Output	Number of Outputs	1 HD-SDI
	SDI Data Rates and SMPTE Standards Accommodated	SMPTE 292M, SMPTE 259M
	Impedance	75ohm
	Return Loss	>15dB to 1.5GHz
	Signal Level	800mV, +/- 10%

Table 6.2 MUX-8258-4C and MUX-8258-8C Technical Specifications

Category	Parameter	Specification
SDI Outputs	DC Offset	<50mV
	Rise and Fall Time (20-80%)	600ps typical @ SD rates 120ps typical @ HD rates
	Overshoot	<10%
	Minimum Video Delay	HD: 2.2us SD: 7us
	Connector Type	BNC
Environmental	Operating Range	5°C to 40°C ambient
Power	Total Power Consumption	MUX-8258-4C: 9.5W MUX-8258-8C: 11W

Channel Status Data Table

Table 6.3 shows the channel status bit information that is used for all output audio.

Table 6.3 Channel Status Data

Byte	Bit	Function	Transmitted
0	0	Professional or Consumer use of Channel Status Block	Professional (1)
	1	Normal Audio or Non-Audio Mode	Normal Audio (0)
	2-4	Emphasis	No Emphasis (100)
	5	Lock Indication	Locked (0)
	6-7	Sampling Rate	48kHz (01)
1	0-3	Channel Mode	2 channel stereo (0001)
	4-7	User Bit Mode	192-bit (0001)
2	0-2	Auxiliary Bit Usage	20-bit audio sample, Aux bits undefined (000)
	3-5	Sample Word Length	20- or 24-bits (101)
	6-7	Alignment Level	Not Indicated (00)
3	0-7	Multi-channel Modes	Undefined (0)
4	0-1	Digital Audio Reference Signal	Not a Reference (0)
	2	Reserved	0
	3-6	Sampling Frequency	Not Indicated (0000)
	7	Sampling Frequency Scaling Flag	No Scaling (0)
5	0-7	Reserved	Unused (0)
6-9		ASCII Source ID	Unused (0)
10-13		ASCII Destination ID	Unused (0)
14-17		Local Sample Address	Unused (0)
18-21		Time of Day	Unused (0)
22	0-7	C Data Reliability	Only the first 5 Status Bytes are marked as Reliable All other Status Bytes are marked as Unreliable
23	0-7	CRC	Calculated CRC

Passing the Status Bytes

The MUX-8258 replaces Channel Status Bytes according to **Table 6.3** or passes Status Bytes through from input to output. The following conditions must be met for Status Bytes to pass:

- AES inputs must be 48kHz synchronous
- SRC is set to OFF
- Data Word Length in the Channel Status Bytes must match what is embedded

Service Information

In This Chapter

This chapter contains the following sections:

- Troubleshooting Checklist
- Warranty and Repair Policy

Troubleshooting Checklist

Routine maintenance to this openGear product is not required. In the event of problems with your MUX-8258, the following basic troubleshooting checklist may help identify the source of the problem. If the frame still does not appear to be working properly after checking all possible causes, please contact your openGear products distributor, or the Technical Support department at the numbers listed under the "**Contact Us**" section.

1. **Visual Review** — Performing a quick visual check may reveal many problems, such as connectors not properly seated or loose cables. Check the card, the frame, and any associated peripheral equipment for signs of trouble.
2. **Power Check —** Check the power indicator LED on the distribution frame front panel for the presence of power. If the power LED is not illuminated, verify that the power cable is connected to a power source and that power is available at the power main. Confirm that the power supplies are fully seated in their slots. If the power LED is still not illuminated, replace the power supply with one that is verified to work.
3. **Input Signal Status** — Verify that source equipment is operating correctly and that a valid signal is being supplied.
4. **Output Signal Path** — Verify that destination equipment is operating correctly and receiving a valid signal.
5. **Unit Exchange** — Exchanging a suspect unit with a unit that is known to be working correctly is an efficient method for localizing problems to individual units.

Bootload Button

In the unlikely event of a complete card failure, you may be instructed by a Ross Technical Support specialist to perform a complete software reload on the MUX-8258.

Use the following procedure to reload the software on a MUX-8258:

1. Eject the card from the frame.
2. Press and hold the **Bootload** button, while re-inserting the card into the frame.
3. Release the button.
   - The **STATUS OK LED** will flash green while the card is waiting for a new software load.
   - If a new software load is not sent to the card within 60 seconds, the card will attempt to restart with its last operational software load.
   - Software loads can be sent to the MUX-8258 via the connection on the rear of the frame.

This completes the procedure for reload the software on a MUX-8258.

Warranty and Repair Policy

The MUX-8258 is warranted to be free of any defect with respect to performance, quality, reliability, and workmanship for a period of FIVE (5) years from the date of shipment from our factory. In the event that your MUX-8258 proves to be defective in any way during this warranty period, Ross Video Limited reserves the right to repair or replace this piece of equipment with a unit of equal or superior performance characteristics.

Should you find that this MUX-8258 has failed after your warranty period has expired, we will repair your defective product should suitable replacement components be available. You, the owner, will bear any labor and/or part costs incurred in the repair or refurbishment of said equipment beyond the FIVE (5) year warranty period.

In no event shall Ross Video Limited be liable for direct, indirect, special, incidental, or consequential damages (including loss of profits) incurred by the use of this product. Implied warranties are expressly limited to the duration of this warranty.

This MUX-8258 User Manual provides all pertinent information for the safe installation and operation of your openGear Product. Ross Video policy dictates that all repairs to the MUX-8258 are to be conducted only by an authorized Ross Video Limited factory representative. Therefore, any unauthorized attempt to repair this product, by anyone other than an authorized Ross Video Limited factory representative, will automatically void the warranty. Please contact Ross Video Technical Support for more information.

In Case of Problems

Should any problem arise with your MUX-8258, please contact the Ross Video Technical Support Department. (Contact information is supplied at the end of this publication.)

A Return Material Authorization number (RMA) will be issued to you, as well as specific shipping instructions, should you wish our factory to repair your MUX-8258. If required, a temporary replacement frame will be made available at a nominal charge. Any shipping costs incurred will be the responsibility of you, the customer. All products shipped to you from Ross Video Limited will be shipped collect.

The Ross Video Technical Support Department will continue to provide advice on any product manufactured by Ross Video Limited, beyond the warranty period without charge, for the life of the equipment.

Contact Us

Contact our friendly and professional support representatives for the following:

- Name and address of your local dealer
- Product information and pricing
- Technical support
- Upcoming trade show information

PHONE	**General Business Office and Technical Support**	613 • 652 • 4886
	After Hours Emergency	613 • 349 • 0006
	Fax	613 • 652 • 4425
E-MAIL	**General Information**	solutions@rossvideo.com
	Technical Support	techsupport@rossvideo.com
POSTAL SERVICE	**Ross Video Limited**	8 John Street, Iroquois, Ontario, Canada K0E 1K0
	Ross Video Incorporated	P.O. Box 880, Ogdensburg, New York, USA 13669-0880

Visit Us

Please visit us at our website for:

- Company information
- Related products and full product lines
- On-line catalog
- News
- Testimonials

www.rossvideo.com

Ross Video Product Number: 8258DR-004-04